

11.0 SNAKE RIVER FALL CHINOOK ESU

11.1 BACKGROUND

11.1.1 Description of the ESU

The Snake River Fall Chinook (SRFC) ESU includes all natural populations of fall chinook salmon in the mainstem Snake River, Tucannon River, Grande Ronde River, Imnaha River, Salmon River, and Clearwater River sub-basins (FR 60; 19342). It also includes the Lyons Ferry Hatchery stock, which was derived from natural fish from within the ESU (BRT 2003). The natural habitat used by this ESU is primarily the Hells Canyon reach of the Snake River downstream from Hells Canyon Dam to the Clearwater River confluence, the Clearwater River downstream from the North Fork Clearwater confluence, and the lower reaches of the major tributaries listed above. Small numbers of SRFC have been observed spawning in the tailraces of the lower Snake River dams and in smaller tributaries. This ESU consists of a single population with hatchery and natural components.

11.1.2 Status of the ESU

The 2003 NOAA Fisheries Biological Review Team (BRT) found the status of SRFC to be improving, but still likely to become endangered. A majority of the BRT considered this as “likely to become endangered,” though some members voted that the ESU was in “danger of extinction” or “not likely to become endangered.” This represented a somewhat more optimistic assessment of the status of this ESU than was the case at the time of the original status review, when the BRT concluded that Snake River fall-run chinook salmon “face a substantial risk of extinction if present conditions continue” (Waples *et al.* 1991). The BRT found moderately high risks in all VSP elements, with mean risk matrix scores ranging from 3.0 for growth rate/productivity to 3.6 for spatial structure (BRT 2003). On the positive side, the BRT noted that the number of natural-origin spawners in 2001 was well in excess of 1000 for the first time since counts at Lower Granite Dam began in 1975 (Table 11.1). Management actions have reduced (but not eliminated) the fraction of fish passing Lower Granite Dam that are strays from out-of-ESU hatchery programs. Returns in 2002 and 2003 also reflect an increasing contribution from supplementation programs based on the native Lyons Ferry broodstock.

In spite of the increases through 2001, the geometric mean number of naturally produced spawners remained less than 1000, a very low number for an entire ESU. In addition, the large fraction of naturally spawning hatchery fish makes it difficult to assess the productivity of the natural population. The relatively high risk matrix scores for spatial structure and diversity reflect the concerns of the BRT that a large fraction of historical habitat for this ESU is inaccessible, diversity associated with those populations has been lost, the single remaining population is vulnerable to variable environmental conditions or catastrophes, and there is continuing immigration from outside the ESU at levels higher than occurred historically. Some BRT members were concerned that the efforts to

remove stray, out-of-ESU hatchery fish only occur at Lower Granite Dam, well upstream of the geographic boundary of this ESU. Specific concerns are that natural spawners in lower river areas will be heavily affected by strays from Columbia River hatchery programs and that this approach effectively removes the natural buffer zone between the Snake River ESU and Columbia River ocean-type chinook salmon. The effects of these factors on ESU viability are not known, as the extent of natural spawning in areas below Lower Granite Dam is not well understood, except in the lower Tucannon River.

Table 11.1. Escapement and stock composition of fall-run salmon at Lower Granite Dam (the 1975-2001 information is taken from the 2003 BRT review).

				Stock Composition of Lower Granite Dam Escapement		
Run Year	Lower Granite Dam Count	Marked Fish to Lyons Ferry Hatchery	Lower Granite Dam Escapement	Natural Origin	Hatchery-Origin (Snake River)	Hatchery-Origin (Non-Snake River)
1975	1,000		1,000	1,000		
1976	470		470	470		
1977	600		600	600		
1978	640		640	640		
1979	500		500	500		
1980	450		450	450		
1981	340		340	340		
1982	720		720	720		
1983	540		540	428	112	
1984	640		640	324	310	6
1985	691		691	438	241	12
1986	784		784	449	325	10
1987	951		951	253	644	54
1988	627		627	368	201	58
1989	706		706	295	206	205
1990	385	50	335	78	174	83
1991	630	40	590	318	202	70
1992	855	187	668	549	100	19
1993	1,170	218	952	742	43	167
1994	791	185	606	406	20	180
1995	1,067	430	637	350	1	286
1996	1,308	389	919	639	74	206
1997	1,451	444	1,007	797	20	190
1998	1,909	947	962	306	479	177
1999	3,381	1,519	1,862	905	879	78
2000	3,830	1,372	2,458	857	1,278	323
2001	10,782	2,064	8,718	2,652	5,330	736
2002 ¹	18,478	2,265	16,181	6,607	9,126	445
2003 ²	20,213					

¹Preliminary estimate of run composition.

²Preliminary total count at Lower Granite Dam.

The 2003 SRFC run composition has not been analyzed, but the preliminary count is in the range of 12,000 adults and 8,500 jacks to lower Granite Dam, continuing the trend of increased natural run sizes over the past several years and exceeding the Interim Abundance Targets (Lohn 2002) for the third consecutive year.

11.2 ASSESSMENT OF THE HATCHERY PROGRAMS

The following sections present a summary of artificial propagation programs in the Snake River fall chinook ESU and the relationship of the hatchery programs with the natural population. The Interior Columbia Basin TRT has identified a single population in this ESU.

11.2.1 Snake River Fall Chinook Hatchery Program

11.2.1.1 Broodstock History. The substantial declines in SRFC populations in the 1970s led to development of an artificial propagation “egg bank” program in 1976. The primary objectives of the egg bank were to maintain the genetic integrity of the SRFC population, provide a source of fish to restore natural spawning, and to mitigate fishery impacts of dam developments (Bugert and Hopley 1989). The egg bank was started with adults trapped at lower Snake River dams, with rearing and release occurring at hatcheries located on the lower Columbia Basin until Lyons Ferry Hatchery on the Snake River was completed in 1984. Broodstock derived through the egg bank program was used as the initial egg source for Lyons Ferry (LSRCP 1998). The first juvenile release from Lyons Ferry was in 1985, had exceptional survival, and contributed a large part of broodstock to the hatchery from 1986-1989 (LSRCP 1998). Out-of-basin stray upriver bright hatchery fall chinook salmon (most from the Umatilla River) were found returning to the hatchery, with strays composing 7.4 percent of returns in 1987, 16.0 percent in 1988, and 43.5 percent in 1989 (LSRCP 1998). Hatchery operations were altered to begin marking all juvenile releases from Lyons Ferry (to allow identification of returning adults), and the 1989 broodyear was eliminated from future broodstock planned for use in the Snake Basin. This resulted in the Lyons Ferry program having to rebuild through much of the 1990s. Since ESA listing in 1992, only marked Snake Basin hatchery adults have been incorporated into the broodstock to prevent incorporating out-of-basin hatchery strays. Hatchery broodstock is currently taken from marked adults returning to Lyons Ferry Hatchery and trapped at Lower Granite Dam. Three acclimation facilities above Lower Granite Dam and the Nez Perce Tribal Hatchery (NPTH) were constructed in the late 1990s and expanded the fall chinook salmon program. Beginning with broodyear 1998, much of the hatchery releases were moved upstream to these sites to supplement the natural production areas.

11.2.1.2 Similarity between Hatchery-origin and Natural-origin Fish. There have been concerns about strays from other hatchery programs being included in broodstock collection and spawning naturally in the Snake River, as discussed above. The 1991 status review team concluded that the naturally reproducing fish in the Snake Basin were a genetically distinct ESU and that the Lyons Ferry hatchery stock was representative of

the ESU (Waples *et al.* 1991). The status of the hatchery stock in relation to the natural component within the ESU was confirmed by a later status review (Myers *et al.* 1998). Marshall *et al.* (2000) provides evidence that suggests genetic diversity unique to the naturally spawning, native SRFC population persists in spite of the low population size during the 1990s and the potential for genetic introgression from out-of-ESU strays.

11.2.1.3 Program Design. There are three hatchery programs currently producing Lyons Ferry Hatchery stock for release in the Snake River. The goals of each include maintaining the current broodstock, developing additional broodstock sources, restoring natural spawning populations through supplementation with hatchery-origin fish, and providing sustainable tribal non-tribal harvest opportunities. The production level of the current programs is 900,000 yearling smolts and 3.8 million sub-yearling smolts (Table 11.2). However plans could increase the sub-yearling component to 6.4 million if Lyons Ferry production is increased to 2.6 million, IPC achieves its full 1.0 million mitigation commitment, and phase two of NPTH expands to produce an additional 1.4 million. Descriptions of the three programs follow:

Lyons Ferry Hatchery

Lyons Ferry Hatchery is an LSRCP mitigation hatchery constructed in 1984 adjacent to the Snake River downstream from Little Goose Dam. The hatchery was developed to compensate for habitat and fisheries lost due to development of the four Federal dams on the lower Snake River (WDFW 2002). The hatchery is funded through the LSRCP and operated by WDFW. Lyons Ferry has been the primary facility for Snake River fall chinook production and currently has a goal of 450,000 yearling smolts for on-station release, 450,000 yearling smolts for release at three fall chinook acclimation ponds (FCAP) operated by the Nez Perce Tribe (NPT) upstream from Lower Granite Dam, 200,000 sub-yearling smolts released at the hatchery, and 1,500,000 sub-yearlings released at the FCAP sites. Lyons Ferry also serves as the primary egg source for the NPTH and IPC mitigation programs.

Idaho Power Company (Hells Canyon/Oxbow Hatchery)

The IPC committed to produce 1,000,000 sub-yearling fall chinook smolts in the 1980 settlement agreement for mitigation of Hells Canyon hydroelectric complex impacts on fall chinook. IPC funded a portion of the construction of LFH in 1984 to provide incubation facilities for sufficient eyed eggs for their smolt commitment. The IPC mitigation program was to start once surplus eggs became available from the Lyons Ferry Hatchery. This did not occur until broodyear 2000. At the present time, IPC is producing 200,000 to 500,000 sub-yearling smolts at Oxbow Hatchery or in contracted hatchery space, depending on the availability of excess eggs from Lyons Ferry. Expansion of IPC production to the full million-smolt commitment is pending completion of a comprehensive management plan and availability of eyed eggs from Lyons Ferry.

Nez Perce Tribal Hatchery (NPTH)

The NPTH is located at about river mile 20 on the Clearwater River and is designed to produce 1,400,000 sub-yearling fall chinook smolts for release in the Clearwater Basin. NPTH receives eggs from Lyons Ferry from adults trapped at Lower Granite Dam and from volunteer returns to the hatchery. NPTH satellite facilities include a final rearing and acclimation pond at North Lapwai Valley and portable acclimation facilities for 200,000 smolts each at Lukes Gulch on the lower South Fork Clearwater River and Cedar Flat on the lower Selway River. The Lukes Gulch and Cedar Flat satellites are to be used in an experiment to develop an early-spawning component of the population that will utilize available habitat where the historical early-fall life history was extirpated by dams.

Table 11.2. Broodyear 2003 Snake River Fall Chinook Salmon Hatchery Production Objectives of Lyons Ferry Hatchery, Fall Chinook Acclimation Program (FCAP), Idaho Power Company Program, and Nez Perce Tribal Hatchery (NPTH). Information in the table was derived from the 2003 U.S. v Oregon Fall Season Agreement.

Release Site	Release Number	Life Stage	Tagged/Marked
Lyons Ferry Hatchery	450,000	Yearlings	All Marked
Lyons Ferry Hatchery	200,000	Sub-yearlings	All Marked
Pittsburg Landing (FCAP)	150,000	Yearlings	All Marked
Pittsburg Landing (FCAP)	400,000	Sub-yearlings	200K CWT
Captain Johns Landing (FCAP)	150,000	Yearlings	All Marked
Captain Johns Landing (FCAP)	800,000	Sub-yearlings	200K CWT
Big Canyon (FCAP)	150,000	Yearlings	All Marked
Big Canyon (FCAP)	500,000	Sub-yearlings	200K CWT
Nez Perce Tribal Hatchery Allotment 1705	500,000	Sub-yearlings	All Marked
Nez Perce Tribal Hatchery North Lapwai Valley	500,000	Sub-yearlings	All Marked
Nez Perce Tribal Hatchery	400,000	Sub-yearlings	All Marked
Idaho Power Company - Below Hells Canyon Dam	500,000	Sub-yearlings	All Marked
Total	900,000 3,800,000	Yearlings Sub-yearlings	

11.2.1.4 Program Performance. Rapid increases in numbers of both natural and hatchery adults returning to the Snake Basin began in 1999 (see Table 11.1), coincident with releases of hatchery-origin smolts from the FCAP sites located on the Clearwater and Snake Rivers. Smolt-to-adult returns (SARs) from the Lyons Ferry Hatchery fish have ranged from 0.031 percent to 0.44 percent from broodyears 1989 to 1994 (Table 11.3). The SARs for more recent broodyears has not been compiled, but it is generally believed to have increased, which is consistent with the increased number of adults returning to the Snake basin (see Table 11.1). Survival information for the more recent FCAP and NPT Hatchery programs have not been compiled. Other factors including water management (water budget flows for fish), improved ocean survival, increased natural spawning, and out-of-basin harvest rate adjustments are believed to have also contributed to the increasing escapement. Spawning escapement of both hatchery and natural fish, as demonstrated by redd count data have increased substantially in recent years (Table 11.4). Monitoring the performance and composition of the hatchery and natural components of the population is obfuscated by the lack of identifying tags and marks on a large proportion of the sub-yearling hatchery-origin releases.

Table 11.3. Smolt-to-adult survival rates from Snake River stock (hatchery produced) fall chinook released into the Snake River from Lyons Ferry Hatchery (1989-1994 broodyears, returns from direct releases are combined with returns from barged releases). Based on CWT recoveries.					
Brood year	Age at release	Total age at return	SAR to LSRCP area (percent)		total SAR (percent)
			SNAKE RIVER	COLUMBIA RIVER	
1989	Sub-yearling	≥ 3	158 (0.031)	88 (0.018)	431 (0.086)
1990	Sub-yearling	≥ 3	192 (0.086)	79 (0.035)	457 (0.204)
1990	Yearling	≥ 3	260 (0.038)	93 (0.014)	456 (0.067)
1991	Yearling	≥ 3	672 (0.088)	160 (0.021)	1110 (0.146)
1992	Sub-yearling	≥ 3	472 (0.228)	193 (0.093)	821 (0.397)
1992	Yearling	≥ 3	1000 (0.166)	985 (0.163)	2601 (0.431)
1993	Yearling	≥ 3	1537 (0.440)	743 (0.213)	3108 (0.890)
1994	Yearling	≥ 3	1158 (0.286)	418 (0.103)	1885 (0.466)

* Information from 2002 WDFW Lyons Ferry Hatchery and Genetic Management Plan

Table 11. 4. Number of fall Chinook salmon redds counted in the Snake River and tributaries between Lower Granite and Hells Canyon dams, 1989-2001. An empty cell indicates no searches were conducted in the corresponding river and year. Some of the data are broken down into method and river mile (RM) sections.

River (method or RM)	'89	'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	'00	'01
Snake (helicopter) ^a	58	37	41	47	60	53	41	71	49	135	273	255	535
Snake (underwater video) ^b			5	0	67	14	30	42	9	50	100	91	175
Clearwater (RM 0-41)	10	4	4	25	36	30	20	66	58	78	179	165	290
Clearwater (RM 41-74)				1	0	0	0	0	0	0	2	7	16
M.F. Clearwater (RM 74-98)						0	0	0	0	0	0	0	0
N. F. Clearwater				0	0	7	0	2	14	0	1	0	1
S. F. Clearwater				0	0	0	0	1	0	0	2	1	5
Grande Ronde	0	1	0	5	49	15	18	20	55	24	13	8	197
Imnaha	1	3	4	3	4	0	4	3	3	13	9	9	38
Salmon				1	3	1	2	1	1	3	0	0	22
Selway						0	0	0	0	0	0	0	0
Potlatch													24
Totals	69	45	54	82	219	120	115	206	189	303	579	536	1303

11.2.1.5 VSP Effects

Abundance – The abundance of both natural and hatchery adults returning to the Snake basin increased substantially in 1999 (See Tables 11.1 and 11.4) and has been on an upward trend. Likewise, the number of naturally spawning fish has increased, and over 2,200 redds were counted in 2003. Returning natural adults exceeded the NOAA Fisheries interim abundance target of 2,500 (Lohn 2002) in 2001, 2002, and probably in 2003 (see Table 11.1).

Productivity – The large increase in redd counts is believed to be an indicator that the number of effective breeders has increased, and observations of fry and smolts indicate spawning success (Billy Connor, USFWS, personal communication). The productivity of naturally spawning fish is obscured by the large number of unmarked hatchery-origin fish and the unknown spawning contribution of the two components. Overall, the combined population has grown rapidly since 1999. There remains uncertainty concerning the long-term ability and carrying capacity of the habitat to support a viable natural component, how quickly the fish can adapt to new or altered habitats, and the success of spawners in different stream reaches. Hatchery effects on natural productivity is unknown.

Diversity – Historical diversity in this ESU has probably been reduced through loss of certain components that once spawned upstream from Hells Canyon Dam (Meyers *et al.* 1998). Although the natural run declined to fewer than 100 adult fish in 1990, a naturally reproducing remnant of the native stock has persisted in the Snake River. The Snake River fall chinook salmon egg bank, which began in the 1970s, and Lyons Ferry Hatchery are believed to have helped preserve remaining diversity, especially when the population declined to very low levels in the early 1990s. Operational actions taken at Lyons Ferry Hatchery to limit the incorporation of out-of-basin hatchery strays is also believed to have contributed positively. However, Snake basin hatchery programs have not incorporated natural fish into the broodstock since listing in 1992 (with the exception of 2003 when a "few" were spawned at Lyons Ferry Hatchery), and there is risk of hatchery and natural fish divergence if this continues into the future. Diversity of the increasingly abundant population is reportedly being expressed as adaptation in spawn timing to better match the altered temperature regime of the remaining habitat (Billy Connor, USFWS, pers. comm.). Proposed future plans to foster development of an early spawning component of the population in the upper Clearwater and to collect broodstock at several sites such as the upper and lower Clearwater River and Hells Canyon Dam may promote more expression of variability through local adaptations. The proportion of out-of-basin hatchery strays to Snake River fish is much less now (see Table 11.1) than reported in previous status reviews, but it remains a risk factor. A genetic analysis of outmigrant smolts produced from spawning above Lower Granite Dam was conducted to evaluate the potential for introgression of outside stocks. Marshall *et al.* (2000) concluded that distinctive patterns of allelic diversity persisted in the stock, indicating that the natural Snake River fall-run chinook salmon run remains a distinct resource.

Spatial Structure – The distribution of naturally spawning fall chinook in this ESU has clearly increased with several hundred redds now counted in the Clearwater River and redds reported in all of the larger tributaries (See Table 11.4). The success of the artificial propagation program and supplementation of natural spawning areas appears to have contributed both to increased abundance and distribution, however the actual contribution of hatchery or natural origin fish to the abundance change is not clear due to the lack of identifying marks on all hatchery-origin fish.

11.3 CONCLUSION

Existing Status: Threatened
BRT Finding: Threatened
Recommendation: Threatened

11.3.1. ESU Overview

11.3.1.1 History of Populations. The original number of populations of ocean-type fall chinook salmon that might have historically occupied the Snake River basin and the relationship of historical populations to the current ESU are unknown. Numerous populations that may have spawned upstream from Hells Canyon Dam, in the Clearwater

River basin, or in other larger tributaries were extirpated by dams or fishing before records were kept. The most productive habitat historically was upstream of the Hells Canyon hydroelectric complex and is no longer accessible to fall chinook salmon.

The ESU now consists of a single population with hatchery-origin and natural-origin components limited to the Snake River downstream from Hells Canyon Dam, the lower reaches of larger tributaries in this reach, a limited number of fish that may spawn in dam tailraces, and the Lyons Ferry Hatchery stock.

11.3.1.2 Association Between Natural Populations and Artificial Propagation.

Natural populations “with minimal genetic contribution from hatchery fish”

None. The genetic heritage of this ESU was largely contained within the Lyons Ferry Hatchery “egg bank” program when the natural component declined to fewer than 100 fish in 1990. The current naturally spawning population is heavily influenced by hatchery supplementation.

Natural¹ populations “that are stable or increasing, are spawning in the wild, and have adequate spawning and rearing habitat”²

Naturally produced fish ranged from about 300 to 900 fish annually in all but one year during the 1990s. Beginning in 2001, natural fish have increased, with 2001 and 2002 estimates being near 2,650 and 6,600, respectively (see Table 11.1 above). These most recent returns have exceeded the interim abundance target of 2,500 (Lohn 2002). Many of these fish are thought to be first-generation hatchery fish that spawned naturally, but monitoring and evaluations are not rigorous enough to separate out the hatchery contribution. Remaining spawning habitat is limited to about 20 percent of the historical range of the ESU. The recent increase in the population has only occurred in the last three years, and longer-term trends are uncertain.

Mixed (Integrated Programs³)

The Lyons Ferry Hatchery, Nez Perce Tribal Hatchery and Oxbow Hatchery programs all release smolts in areas where adults are expected to return and spawn. More than half of the natural spawning adults consist of first-generation, hatchery-origin salmon. The integration of natural-origin

¹ See HLP for definition of natural, mixed and hatchery populations

² HLP Point 3

³ Integrated programs follow practices designed to promote and protect genetic diversity and only use fish from the same local population for broodstock (both natural-origin fish, whenever possible, and hatchery-origin fish derived from the same local population and included in the ESU). Programs operated to protect genetic diversity in the absence of natural-origin fish (e.g., captive broodstock programs and the reintroduction of fish into vacant habitat) are considered “integrated”.

salmon into hatchery broodstocks the last 10 years has been limited to few individuals in 2003.

Hatchery (Isolated⁴)

None.

11.3.2. Summary of ESU Viability

11.3.2.1. Abundance. The BRT assigned a moderately high risk factor to abundance of this ESU (BRT 2003). Natural-origin returns have increased significantly since 2001 (see Table 11.1, above). The total number of natural spawners (i.e., the combination of natural-origin and hatchery-origin fish) has increased dramatically in the past three years, in part due to apparently improved environmental conditions and hatchery supplementation that began in 1996. The interim abundance target (IAT) established by NOAA Fisheries for the Snake River fall chinook ESU is an 8-year geometric mean of 2,500 naturally-produced spawners (Lohn 2002). Returns are believed to have exceeded this level for the last three run years.

11.3.2.2. Productivity. Productivity was ranked as a moderate risk, reflecting the rebuilding trend of the population (BRT 2003). Longer-term trends in productivity are uncertain and the effects from the supplementation program are unknown.

11.3.2.3 Spatial Structure. The BRT ranked spatial structure as a high risk factor, reflecting the restricted habitat that remains available to the ESU and dependence on a single hatchery population for supplementation (BRT 2003). The majority of historical habitat is no longer accessible to Snake River fall chinook salmon and will likely remain inaccessible for the foreseeable future. Utilization of tributary habitat has been increasing and corresponds to the increasing population.

11.3.2.4 Diversity. The BRT rated diversity as a high risk factor, reflecting the restricted habitat that remains available and dependence on a single hatchery population for supplementation (BRT 2003). The Lyons Ferry egg bank program is believed to have preserved diversity within this ESU, especially when the natural population declined to fewer than 100 fish in 1990. The very limited incorporation of natural fish into the hatchery broodstock (a few natural fish were incorporated in 2003 for the first time since listing) is an ongoing risk factor, especially given the high contribution of hatchery fish on the spawning grounds. This risk could be reduced by incorporating natural fish into the broodstock.

11.3.3. Artificial Propagation Record

11.3.3.1 Experience with Integrated Programs. The Lyons Ferry Hatchery fall chinook

⁴ Isolated programs do not follow practices designed to promote or protect genetic diversity. Fish that are reproductively isolated are more likely to diverge genetically from natural populations included in the ESU and to be excluded themselves from the ESU.

salmon were founded by collecting natural fish at the lower Snake River Dams beginning in 1976 as an egg bank program. The integration of natural fish into the hatchery broodstock did not occur in the decade prior to 2002. In 2003, a few natural fish were spawned with hatchery broodstock. Three hatchery programs produce fall chinook: the LSRCP-funded Lyons Ferry Hatchery (operated by WDFW), BPA-funded Nez Perce Tribal Hatchery (NPT operated), and IPC mitigation (operated by IDFG). The two state agencies have extensive artificial propagation experience, and NPT has only recently operated a hatchery.

11.3.3.2 Are Integrated Programs Self-Sustaining. The Lyons Ferry program is self-sustaining, but demands for eggs to support the start-up of Nez Perce Tribal Hatchery and IPC mitigation (at Oxbow Hatchery) are not fully being met. Trapping of adults for broodstock also occurs at Lower Granite Dam. Both the natural and hatchery components of the population have been increasing since 2001.

11.3.3.3 Certainty that Integrated Programs will Continue to Operate. Snake basin hatchery programs are believed to have high certainty of continuing into the future. BPA provides funding to the USFWS for LSRCP (a program mandated by Congress) and the NPT Hatchery, while the IPC is required to provide funding program as a condition of its hydroelectric license. Each of the propagation programs in this ESU has long-term agreements and stable funding.

11.3.4. Summary of Overall Extinction Risk Faced by the ESU:

S Snake River fall chinook salmon are not in immediate risk of extinction. This ESU has been increasing the last three years, with natural fish numbers above the 2,500 interim abundance target and the combined hatchery and natural population above 10,000. While the near-term population abundance is encouraging, the positive trend in abundance and productivity must be demonstrated for a longer period before a long-term conclusion is possible. There also remains significant uncertainty concerning the contribution of first-generation hatchery fish to natural fish returns.

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